understand such an attitude in so experienced a computer as Prof. Lohse. However, this only emphasises the thoroughness with which his work has been done. It is a well-planned and complete work, and Prof. Lohse is to be congratulated on making so real a contribution to double-star astronomy.

The following predicted places for 1910·0 for a few of the more interesting binaries may be found useful:—

	°		″
η Cassiopeiæ	241·1	and	6·24
Sirius	89·4	,,	8·87
Castor	220·5	,,	5·44
α Centauri	215·3	,,	19·41

NOTES.

THE third International Congress of Physiotherapy will be held in Paris on March 30 to April 2, 1910. The congress is to be divided into seven sections.

A PRIZE of 160*l.* has been awarded to M. W. Haffkine by the Paris Academy of Medicine for his work on inoculation against cholera.

THE Bradshaw lecture of the Royal College of Physicians of London will be delivered on November 2 by Prof. J. A. Lindsay, who will take as his subject Darwinism and medicine. The FitzPatrick lectures will be delivered by Sir T. Clifford Allbutt, K.C.B., F.R.S., on November 4 and 9. The subject will be Greek medicine in Rome.

THE Société d'Hygiène de l'Enfance of Paris, we learn from the *Lancet*, is offering prizes for essays on the punishments of children. The essays, which must be original, and written in French, German, English, Italian, or Spanish, will be received by the society not later than December 31 next. The papers are to become the property of the society, which reserves the right of selecting from them material for a pamphlet.

ACCORDING to the *Times*, the exhibit of British chemical industries at next year's International Exhibition at Brussels promises to be of great interest and importance. It is stated that the new exhibitions branch of the Board of Trade is already experiencing some difficulty in providing for the requirements of would-be exhibitors, although the area originally allotted to the exhibit has been largely added to.

PRIZES to the value of 1500*l.* are offered by the National Medical Academy of Mexico for work on typhus fever. Of the sum named, 1000*l.* will be awarded to the discoverer of the cause of typhus, or of a curative serum, and 500*l.* to the investigators whose work is judged most useful in helping towards such discovery. The competition is international, but all essays must be written in Spanish. They can be received up to February 28, 1911.

THE annual "Fungus Foray" of the Essex Field Club will be held on Saturday, October 30, at High Beach, Epping Forest, under the direction of Mr. George Massee, of the Kew Museum. Botanists wishing to attend should apply for programmes to Mr. W. Cole, the Essex Museum of Natural History, Romford Road, Stratford, Essex.

THE death is announced of Prof. J. Scott, author of various text-books on farm engineering, and formerly professor of agriculture and rural economy at the Royal Agricultural College, Cirencester.

THE death is reported, in his sixty-third year, of Dr. Irving Stringham, professor of mathematics in the University of California since 1882. He was a graduate of Harvard, and also spent some time in study at European universities. He was the editor of the American edition of C. Smith's "Elementary Algebra," and was the author of a "Uniplanar Algebra."

DR. GEORGE E. POST, whose death was recently reported at the age of seventy, was for many years head of the Medical College established at Beirut, Syria, by the American Presbyterians. He was the author of several medical and scientific text-books in the Arabic language, as well as of a flora of Syria, Palestine, and Egypt in the same tongue. His "Plantæ Postianæ" was written in Latin and French, and published at Geneva. He contributed also to the leading English and American Biblical dictionaries a large number of articles on the flora of Bible lands. In recognition of his work at Beirut Dr. Post received decorations from the Turkish and German Governments.

Science reports the return of the Peabody Museum Expedition, which for the past three years has been exploring the headwaters of the Amazon River in the interior of Peru and Bolivia. The primary object of the expedition was the study of the native tribes of those regions, but, incidentally, collections were made in natural history; meteorological observations were taken, and topographical work was done. A map of the entire region, based on traverses and astronomical observations, was made for the Peruvian Government.

DR. ALLAN KINGHORN has been sent by the Secretary of State for the Colonies to West Africa to investigate sleeping sickness there, with the view of recommending measures for the prevention of the spread of the disease into certain of the British West African colonies. Dr. Kinghorn recently returned from north-east Rhodesia and Central Africa, whence he was sent with Mr. R. E. Montgomery by the Liverpool School of Tropical Medicine to prosecute inquiries into sleeping sickness, and has just completed a report, with Mr. Montgomery, of the Zambezi Sleeping Sickness Expedition.

THE following courses of free public science lectures are announced for delivery in the Manchester Museum:—some forms of vegetation, by Prof. F. E. Weiss, on November 6, 13, and 20; some problems of embryology, by Prof. S. J. Hickson, F.R.S., on January 8, 15, and 22; and the structure of a crystal, by Sir T. H. Holland, K.C.I.E., F.R.S., on February 5, 12, and 19. In addition to the foregoing, Prof. Boyd Dawkins, F.R.S., has begun the delivery of a course of twelve short addresses on geological subjects on Saturday and Sunday afternoons.

WE learn from the *Revue scientifique* that the Institute of France has received a gift of 50,000 francs from M. Patouillard to found two Montyon prizes, one literary and one scientific, of equal value. The latter is to be reserved for some man of science distinguished in electricity chosen by the Paris Academy of Sciences. From the same source we learn that Dr. Von Brunck, formerly director and a member of the committee of management of the "Badische Anilin," has made a gift of 50,000 marks to the Munich Academy on the occasion of the fortieth anniversary of his entry in the industry.

A MEETING was held on October 13 at Christiania to consider plans for the proposed Zeppelin Polar Expedition, at which, the *Times* reports, Prof. Hergesell explained the object of the expedition, which, as at present planned, will last one Arctic summer. It will not be undertaken until the development of the airship has given it an effective scope of 2500 kilometres, or a journey of three or four days without landing. The pioneer expedition may be expected to take place in two or three years' time. Meanwhile, a ship will proceed next summer to Spitsbergen to make preliminary investigations for the purpose of discovering suitable airship anchorages. During 1911 an airship will make long experimental cruises over the sea from a port on the north coast of Germany. In 1912 two airships will proceed to Spitsbergen and establish a central station, equipped with wireless telegraphy, in Cross Bay. The second airship will remain in reserve.

THE Royal Scottish Museum has recently acquired by purchase the well-known collection of Scottish Carboniferous fossils formed by Mr. James Neilson, Glasgow. This collection contains more than twenty thousand specimens, among which are many type-specimens of lamellibranchs and brachiopods, which have been figured in the publications of the Palæontographical Society and elsewhere. These are remarkable for their wonderfully perfect state of preservation, many of them showing delicate internal structures, such as the spires of Spirifer. The collection also contains Gyracanthus spines, of remarkable size, and other valuable fish fossils, including the unique *Cladodus neilsoni* (Traquair). Some time must elapse before the specimens can be arranged for exhibition, but, in the meantime, facilities will be given, so far as possible, to experts who wish to study the collections.

A REUTER message from Simla states that the Imperial Malaria Conference, which has finished its sittings, has drawn up a series of conclusions and recommendations under the following heads, among others:—(1) The appointment by the Government of India of a scientific investigation committee, to be linked up with special organisations for dealing with malaria in each province, the investigations to be specially directed to (*a*) the distribution of malaria in India; (*b*) the epidemiology and endemiology of the disease; and (*c*) the actions of quinine and other remedies for malaria. (2) Practical measures, including (*a*) the extirpation of anopheles, regarding which further investigation is recommended in order to discover how this can be done at a reasonable cost; (*b*) minor drainage operations, which are recommended when they are certain to be effective; (*c*) the restriction of wet cultivation near towns when the lands cultivated are known to be a source of anopheles; (*d*) the introduction of fish into tanks and other collections of water; and (*e*) the oiling of small collections of water which cannot be filled up. (3) (*a*) On the suggestion of the president of the conference, Sir Herbert Risley, it is recommended that committees of officials and non-officials, directed by the elected members of the new councils, be formed to spread among the people knowledge regarding malaria and the measures which it is possible to take against it; (*b*) it is also recommended that the subject be taught in the schools. (4) Local Governments should be invited to make an annual assignment of funds for malaria investigation and prevention.

THE project of organising and bringing into existence in 1911 a "Scottish Exhibition of National History, Art and Industry" is rapidly taking shape. The object primarily aimed at is to aid, and finally complete, the raising of a fund for the endowment of a chair of Scottish history and literature in Glasgow University; but, according to the *Engineer*, the executive council is considering a scheme of exhibits which takes account of the following:—that there should be a collection of exhibits showing the varied nature of Scotland's industries and of those carried on by Scotsmen in the colonies and abroad, and that in many industries a contrast should be made between the old and the new; that there should be an electricity exhibit, dedicated to the memory of Lord Kelvin; that there should be a shipbuilding and marine engineering exhibit of a historical nature, showing the development of steam navigation in its home on the Clyde; that the river Kelvin should be taken advantage of to represent historic episodes in Scottish life and industry; that the colonies, so largely peopled from Scotland, be invited to tell of the progress of the Scot abroad.

DR. L. A. BAUER informs us that the magnetic survey vessel, the *Carnegie*, arrived at Falmouth on October 14, twelve days after leaving St. John's, Newfoundland. Magnetic observations were secured every day except one. The *Carnegie* will remain at Falmouth until the end of this month. Having completed the harbour observations and the tests ashore of the instrumental constants, the *Carnegie*, under the command of W. J. Peters, who was in charge of the Pacific Ocean vessel, the *Galilee*, from 1906–8, will go to Madeira, returning to New York, *viâ* Bermuda, about March 1 of next year. The September number of *Terrestrial Magnetism and Atmospheric Electricity* contains an account of the launch of the *Carnegie* at Brooklyn in June last, and her departure on this—her first—cruise to Newfoundland, Hudson Straits, and England. There is a further article, by Mr. J. Craig, jun., on the non-magnetic gas engine with which the vessel had to be provided to enable her to continue her voyages when the wind was not strong enough for sailing. It appears that the cheapest power plant would have been a gasoline engine, but that the cost of maintenance would have been greater than for a gas-producer plant, which was finally selected as best. The material used in construction was mainly manganese bronze, a few of the valves being the only parts of steel or nickel-steel. The engine is of the four-cylinder type, and resembles the regular Craig air-starting engine.

THE second Model Engineer Exhibition is now being held at the Royal Horticultural Hall, and will remain open until October 23. The opening ceremony was performed by Sir Hiram Maxim on October 15, and the appropriateness of the selection of this distinguished experimenter in aviation is evident from the very large number of model aëroplanes exhibited. These constitute a special competition class, in which there are more than fifty entries. Many of the designs are original, others are copies of well-known successful types, and we noticed some in which the workmanship was excellent. Considerable variety is shown in the selection of the material for the supporting surfaces; generally fabric is employed, but others having wooden, aluminium, and mica planes are to be seen. There is also a very fine collection of steam and other engines, model yachts, and electro motors. An interesting feature of the exhibition is the completely equipped model engineering workshop in operation. Several firms also show their specialities in machine tools, &c., for model-making. Perhaps the most noteworthy advance in model work recently has been in connection with model motor-boats. At the time of the first exhibition, in 1907, the speed record was 8·76 miles per hour; the present record is above 15 miles per hour, a result which is very creditable to the ability of amateur engineers.

PROF. C. LOMBROSO, professor of criminal anthropology and psychiatry in the University of Turin, died on October 19 at seventy-three years of age. From an interesting notice of his work and career in the *Times* of

October 20 we derive the following particulars as to his work and career. After graduating at Padua he went for some time to Paris and Vienna to continue his studies. At the very outset of his medical work he was attracted by nervous and mental diseases, and while still a student he published two treatises, one on "Insanity in Antiquity" and the other on "The Insanity of Cardan" (the sixteenth-century mathematician). In the latter essay he first advanced the theory of the relation between genius and crime, which was to form the chief purport of his later work. While serving as a surgeon in the army his attention was attracted at Calabria by the diversity of type exhibited by the soldiery, who were drawn from all parts of Italy. He conducted a series of studies, which he endeavoured to make the basis of an anthropological chart of Italy. He measured and examined no fewer than 4000 individuals, and gained an invaluable experience, which stood him in good stead in his subsequent criminological investigations. The removal of his regiment to Pavia, a university town, gave Lombroso an opportunity of continuing his study of nervous diseases at the district asylum, but his military superiors did not look with favour on these scientific labours; difficulties were placed in his way, and Lombroso finally determined to leave the army. Shortly after, he was appointed professor of psychiatry at the University of Pavia at a small salary. He prepared a short inaugural address entitled "Genius and Insanity," in which all the main ideas of his *magnum opus* were outlined. In 1872 he made a discovery which proved to be of considerable scientific and economic importance. He noted the fact that a large number of the inmates of the asylum were suffering from "pellagra," a curious disease, which first affected the skin and afterwards attacked the brain and nervous system. Lombroso discovered that the disorder was to be traced to a poison contained in diseased maize. Upon his appointment to the chair of psychiatry at Turin Lombroso continued his criminological studies. He was the first to apply the anthropometric method to the study of criminology, and his collection of skulls was unique. He showed that the overwhelming majority of criminals suffered from some form or other of nervous disease. These views are embodied in his great work entitled "L'Uomo Delinquente," published in 1889. Lombroso had a somewhat similar theory for the existence of genius, which he declared was a form of larvate epilepsy; this somewhat fantastic thesis was presented in his "L'Uomo di Genio," which has been translated into several languages.

In Witherby's *British Birds* for October Messrs. W. Davies and F. Coburn record the breeding, during the past season, of the marsh-warbler in Worcestershire. The nest was attached to the stems of cow-parsnip and nettles. Mr. Coburn was of opinion that this was the first record of the breeding of the species, but, as the editor points out, a pair nested in the valley of the Avon in 1892.

The *Selborne Magazine* for October opens with a short biography, accompanied by a portrait, of Sir Joseph Hooker. In connection with the discovery of fossil bones near Crayford, referred to in the report of the Selbornian excursions, the editor will perhaps permit us to point out that no such species as *Canis domesticus* is known to science, and that none of the bear-skulls found in English Pleistocene deposits belongs to the American *Ursus horribilis.*

At the conclusion of a paper on the birds of the mountains of the Malay Peninsula, published in vol. ii., No. 4, of the Journal of the Federated Malay States Museums, Mr. H. C. Robinson expresses the opinion that the fauna is of Indo-Malay origin, and that the species have spread in comparatively recent times north-west from the Sunda islands rather than south-east from Burma. Secondly, that the mountain-fauna is composed of a continental and a Sumatran element, and that the connection with the mountain-fauna of Burma is remote. On the other hand, there appears to be evidence of a recent land-connection with Sumatra, and also that the southern portion of the peninsula has been disconnected from the land to the north.

Considerable interest attaches to the discovery of large quantities of shells of the pearl-mussel (*Unio margaritifer*) in gravel of apparently Pleistocene age in the Thames near Mortlake. Messrs. J. W. Jackson and A. S. Kennard, who record the fact in the October number of the *Journal of Conchology*, state that "at the close of the Pleistocene period the land stood at a much higher level than it does to-day, and the Thames was then a quick-flowing stream in a deep and narrow gorge. . . . The cause of the extinction of the species is explained by the fact that as the land sank the river became more sluggish, and silt and mud commenced to accumulate. Such conditions would prove highly detrimental to its welfare, and the species soon ceased to exist."

Taking as his text the apparent fact that a nematode worm effects an entrance into the swim-bladder of rainbow-trout by burrowing through the intestinal wall, and thereby likewise permits the entrance of bacteria, Dr. A. E. Shipley, in the September issue of the *Journal of Economic Biology*, brings forward additional evidence in support of his view that the appendix vermiformis is a functional, and not a decadent, organ, and that appendicitis is probably due to the presence of entozoa. Messrs. Berry and Lack are cited as evidence in support of the contention that the appendix is a functional lymph-gland, and the author expresses his disbelief in the existence of any functionless organs. The remarkable increase of appendicitis in modern times is attributed by him to the practical cessation of the administration, from time to time, of vermifuges, and certainly no other satisfactory explanation of the phenomenon has been given. If this suggestion be substantiated, it tends to prove that our forefathers were not such fools as we often imagine.

The importance and interest of large and properly classified and arranged collections of photographs—whether these subjects be nature or art—were emphasised by Sir Martin Conway at the Museums' Conference recently held at Maidstone, and his address is published in full in the September number of the *Museums Journal.* Many difficulties must be encountered in forming extensive collections of this nature; but, provided the necessary funds are available, they are not insurmountable, and Sir Martin urges that series of photographs relating to particular subjects ought to be collected by the various museums in the country. If private collectors would also devote themselves to photographs, a system of exchanges could probably be established which would greatly facilitate matters.

The common fresh-water Hydra was one of the first subjects upon which the experimental zoologist exercised his special genius. More than a century and a half ago Trembley demonstrated the remarkable power of regeneration of lost parts which this little animal possesses, and not a few experimenters have followed in his footsteps. Of late years there has been quite an outburst of activity in this direction, and some highly remarkable results have been obtained. The latest contribution is a paper, by Miss

E. N. Browne, in the August number of the *Journal of Experimental Zoology* (vol. vii., No. 1), dealing with the production of new hydranths by the insertion of small grafts from another individual of the same species. This paper is particularly interesting on account of the ingenuity of the methods employed. In order to determine the exact origin of the regenerating material, the author makes use of Whitney's discovery that the green colour can be entirely removed from *Hydra viridis*, without killing the animal, by keeping it for some weeks in a 0·5 per cent. solution of glycerin. The artificial white hydras thus produced form perfect grafts with ordinary green forms, giving rise to parti-coloured colonies in which the boundaries between the tissues of the green and white components remain clearly defined.

Irish Gardening (October) contains various seasonable articles, notably on the cultivation of seakale and the gloxinia. A very charming bell-shaped ericaceous plant, *Zenobia speciosa*, is recommended for the garden by Mr. C. F. Ball; in the variety *pulverulenta* it attains to the dimensions of a good-sized bush. It requires a peaty soil or the nearest equivalent, and is propagated from seed or by layers.

THE *Country Home* (October) appears in an enlarged form from the offices of the *Sphere* and *Tatler*. The botanical and zoological articles are chiefly utilitarian or popular. The intensive cultivation of asparagus is explained by Mr. L. Terasse, and vegetative propagation forms the subject of an article by Mr. W. M. Webb, while Mr. H. B. Buchanan gives advice on the breeding of pigs.

FOLLOWING up a line of work instituted in the United States of America, the examination of parasitic fungi that attack scale insects has been taken up by the Department of Agriculture for the West Indies. Three species of Ascomycetes, *Sphaerostilbe coccophila, Ophionectria coccicola*, and *Myriangium Duriaei* are specified in the *Agricultural News* (September 18) as having been taken on scale insects infesting lime or citrus trees in Dominica, St. Lucia, and other islands, and a fourth fungus is noted, but not identified. It is proposed to experiment with cultures of these fungi on nutrient media which could be distributed to cultivators.

THE most striking point in a description of fungus maladies of the sugar-cane, prepared by Dr. N. A. Cobb, and published in Bulletin No. 6 of the division of pathology and physiology in connection with the Hawaiian Sugar-planters' Association, is the attribution of parasitism to the phalloid fungi *Ithyphallus coralloides* and *Clathrus trilobatus*. The mycelium of Ithyphallus was found attached to cane trash and the roots, while the mycelium of Clathrus passed in among the roots of canes where disease was abundant, so that the author classes them with species of Marasmius as sources of root disease. With the view of identifying the mycelium of these Phalloideæ, a special study was made of their sphæro-crystals.

IN connection with a visit of German systematic botanists, Dr. E. Issler prepared an account of vegetation conditions in the Central Vosges Mountains, which is published in Engler's *Botanische Jahrbücher* (vol. xliii., part iii.). The formations distinguished in the montane region are spruce, beech, mixed fir woods, and the vegetation of the forest streams. It is a curious fact that the beech in many places ascends higher than the conifers, the reason being that the upper tree limit, at the low altitude of 4000 feet, is determined by the wind, which the beech is better able to withstand. In the subalpine region different types of flora are provided by the rocks, meadows, and swamp, and in certain parts there are areas of ling and sphagnum moors. Among the rare plants to be found are *Mulgedium alpinum, Rhodiola rosea, Luzula spadicea*, two species of Isoetes, and *Subularia aquatica*.

THE *Bio-chemical Journal* for September (iv., No. 8) contains a paper, by Dr. Otto Rosenheim, on the nomenclature of lipoid substances. He proposes to classify them in three main groups, the cholesterins, the cerebrogalactosides, and the phosphatides. Prof. Moore and Drs. Wilson and Hutchinson contribute a paper on the biochemistry of hæmolysis.

PROF. HALLIBURTON, in the *Journal of Hygiene* (vol. ix., No. 2, September), directs attention to the fact that large quantities of flour, both in this country and abroad, are artificially bleached. Some experiments he has performed distinctly indicate that both the starch and the gluten are rendered less digestible by the process of bleaching, though whether the change is sufficient to be serious to children or invalids is a question on which there is at present no evidence.

IN the Bulletin of the Johns Hopkins Hospital for September (xx., No. 222), Dr. Charles White discusses in a suggestive manner the municipal management of tuberculosis. He points out that our struggle must be for an immune race, not for the extermination of the last tubercle bacillus. More and more we see the evidence of protection of *small* doses in healthy resistant bodies. In municipalities the aim should be to get rid of sources of large doses of tubercle bacilli, and to establish resistant bodies by healthy lives, mainly in the children.

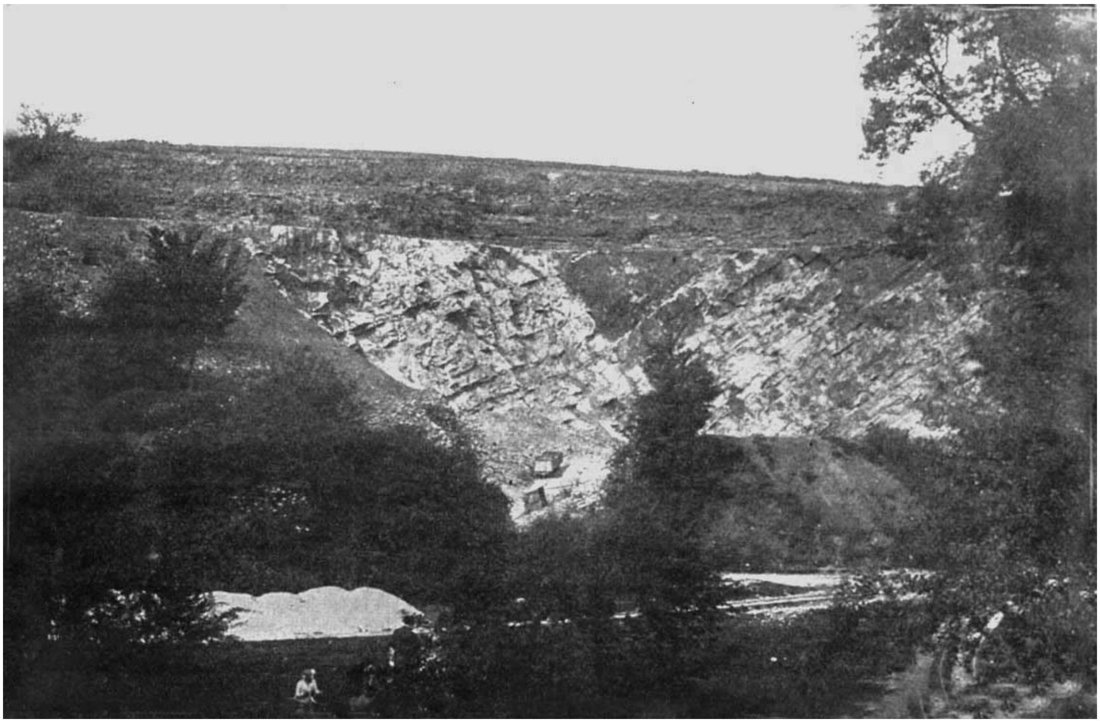
AN account of the mathematical work of Sully Prudhomme is given by Prof. H. Poincaré in the *Revue générale des Sciences* for August 15. Sully Prudhomme received a scientific education in his youth, but was prevented by ill-health from attending the École polytechnique. That he nevertheless gave a large amount of attention to mathematics is evidenced by the numerous manuscripts left by him, including the rough drafts of a memoir on geometry. It appears, however, that the manuscripts now in existence cannot be regarded as more than rough drafts of ideas which Prudhomme had further developed and considerably modified after writing them. Prof. Poincaré concludes that it would be undesirable to publish them *in extenso*, and he therefore devotes the concluding portion of his paper to a general account of their salient features.

UNDER the title of "The Gambler's Ruin" (*Annals of Mathematics*, x., 4), Prof. J. L. Coolidge discusses certain problems connected with games of chance which have not hitherto received complete treatment. It is pointed out that while the problem of determining the odds that one player may ruin another has been worked out thoroughly for the case where the amount staked at each turn is the same, the case where the stakes are varied, whether they be limited or unlimited, has been less fully discussed. The author considers the "systems" proposed at Monte Carlo and elsewhere, and gives a deductive proof that no such system can have more than an easily calculable chance of success. He concludes with the quotation from Sir Hiram Maxim's book:—"Je me rends parfaitement compte du désagréable effet que produit sur la majorité de l'humanité, tout ce qui se rapporte, même au plus faible degré, a des calculs ou raisonnements mathématiques."

A SYSTEMATIC study of the influence of the surrounding medium on the lines of the spark spectrum has been undertaken by Dr. H. Finger at the suggestion of Prof.

Konen, of Münster, and his principal results are summarised in No. 17 of the *Verhandlungen der deutschen physikalischen Gesellschaft*. A comparison has been made between the spectra of more than twenty metal electrodes in air and in water, the spark being produced by an induction coil of 40 cm., having a capacity of 0·02 microfarad in parallel with its spark gap. The spectra in air and in water were photographed on the same plate, a concave grating of radius 180 cm. being used. The spectra in water show no air lines, but a large proportion of them show a more or less extended continuous spectrum with the lines of water vapour reversed. Some lines are unchanged, while others are broadened on one or on both sides, lines belonging to the same series being modified in the same sense. No trace of the spectra of salts in solution in the water has in any instance been detected.

PART iii., vol. xvi., of the Proceedings of the Cotteswold Naturalists' Field Club maintains the high standard of style and illustration which distinguishes this publication. A large part is concerned with the record of excursions chiefly to places of geological or antiquarian interest, and is illustrated by no fewer than nine plates of photographic reproductions. Of the papers published, the longest is on "The Lower Severn: Valley, River, and Estuary from the Warwickshire to the Bristol Avon," by Mr. T. S. Ellis. The principal aim of the author is to show that the generally accepted views of river development associated with the name of Prof. W. M. Davis are not applicable to the district with which he deals, and by inference to other districts also. His position is indicated by the following sentence:—"As I believe, we cannot have a right conception of the development of rivers unless we keep our minds free from all idea of original lines of streams or of any principal line as the initial condition. In my view, a river system is evolved not *into*, but *from* a network of streams, formed in the drainage area before any definite line of principal stream has been settled." Accounts are given of places and objects of scientific interest visited during excursions, and among these is a record of an excursion to Shepton Mallet and Vallis Vale, which is well known for its romantic scenery and geological unconformities. The report contains the accompanying illustration, reproduced by permission of the council of the Geological Society, of the classic section showing Oolite resting upon Carboniferous Limestone, which was pictured by Sir H. de la Beche. Short papers by Messrs. L. Richardson and C. Upton, and a report by the Rev. H. J. Riddelsdell, on the progress made in connection with the flora of Gloucestershire, complete the issue.



View of Quarry, showing the Inferior Oolite resting unconformably upon the Carboniferous Limestone in Vallis Vale. Photograph by Prof. S. H. Reynolds.

Le Radium for August contains a very useful table of the principal minerals containing uranium and thorium, prepared by M. B. Szilard, of Madame Curie's laboratory. It occupies seven pages of the periodical, and gives the name, the composition, the percentages of uranium and of thorium, the localities in which the mineral is found, and its crystalline form. In addition, a map of the world, in which the localities are shown, is given.

MR. HAROLD MOORE, of Woolwich Arsenal, read a paper on the Brinell method of determining hardness at the International Association for Testing Materials. We note from an abstract in *Engineering* for October 8 that the author's results show that the thickness of the test specimen has no influence on the result provided that the depth of the impression made by the ball does not exceed one-seventh the thickness of the specimen. A safe rule to be adopted is that the distance of the centre of the impression from the edge of the specimen should not be less than 2·5 times the diameter of the impression. For calculating the hardness number, 30° should be chosen as the standard angle of impression, this giving a diameter of impression equal to one-half the diameter of the ball. The hardness number then becomes the mean pressure per unit area when the diameter of the impression is one-half the diameter of the ball. In practice it is convenient to employ a known load, and measure the diameter of the impression obtained. The hardness number is then calculated from the formula

$$H=\frac{16PD^{n-2}}{\pi(2d)^n},$$

where P is the load in kilograms, D is the diameter of the ball, d is the diameter of the impression, and n is a coefficient determined by making two impressions with the same ball and different loads, and applying the formula

$$n=\frac{\log P_1-\log P}{\log d_1-\log d}.$$

A REVISED impression of Sir Robert S. Ball's little work "Time and Tide" has just been issued by the Society for Promoting Christian Knowledge.

A CHEAP edition of "Extinct Animals," by Sir E. Ray Lankester, K.C.B., F.R.S., has been published by Messrs. Constable and Co., Ltd. The original edition of the work was reviewed in NATURE of November 2, 1905 (vol. lxxiii., No. 1879).

WE are in receipt of a new catalogue of books and papers (more than 1400 in number) dealing with ornithology which Messrs. John Wheldon and Co., of Great Queen Street, W.C., have for disposal.

THE October classified list of second-hand scientific instruments offered for sale or hire by Mr. Charles Baker, of High Holborn, has reached us. The catalogue, which contains upwards of 1300 items, will be sent free of charge upon request.

MM. A. HERMANN ET FILS, of Paris, have published a translation into French, by Dr. Paul Lemoine, of Prof. James Geikie's "Structural and Field Geology," which was reviewed in these columns on July 6, 1905 (vol. lxxii., p. 223). M. Michel-Lévy has contributed a preface. The price of the French work is 15 francs.

A NEW edition (the eighth) of "Quantitative Chemical Analysis," by Clowes and Coleman, has been published by Messrs. J. and A. Churchill at 10*s*. 6*d*. net. The work has been revised and enlarged, but the size of the page having been increased the thickness of the volume remains as before.

MESSRS. CONSTABLE AND CO., LTD., have sent us a cheap edition of "Time and Clocks," by H. H. Cunynghame, C.B. A review of the first edition appeared in the issue of NATURE for January 17, 1907 (vol. lxxv., No. 1942).

OUR ASTRONOMICAL COLUMN.

MARS.—The advisability of watching Mars closely, at this period of favourable opposition, and seasonal changes on the planet itself, is illustrated by a brief message communicated to the *Astronomische Nachrichten* (No. 4362, p. 303, October 9) by M. Jarry Desloges. Whilst the planet was being observed at 9h. 15m. on October 6, a projection was seen on the terminator in the neighbourhood of Electris. This projection lasted for ten minutes only, whilst a similar one observed by Messrs. Lowell and Slipher, on May 25, 1903, endured for only thirty-one minutes; the latter was ascribed to a cloud of dust some 300 miles in length.

In No. 4361 of the same journal M. Jonckheere announces the discovery, on September 28, of a canal which is probably a new one, and extends from Cyclopum Lucus to Hephæstus; the same observer records a further observation of the new land "Stella" on October 7.

A large number of observations of different features are recorded and illustrated by MM. Quénisset and Antoniadi in the October number of the *Bulletin de la Société astronomique de France*. Numerous canals were observed, the Solis Lacus was seen to be divided, and important changes in the colour and visibility of various regions were closely followed. M. Antoniadi is confirmed in his opinion that these changes are caused by the passage of Martian clouds across the various features, and, from the yellowish tinge which colours the indistinct areas, he confirms the opinion expressed by Prof. W. H. Pickering in 1905, that these Martian clouds are probably yellow.

SOLAR OBSERVATIONS: A NOVEL SPECTROSCOPE.—In order to continue his solar observations, Mr. W. M. Mitchell found it necessary, at the Haverford College Observatory, to devise a large spectroscope which might be used in conjunction with a small equatorial. The telescope at Haverford is of 10 inches aperture and 12 feet 6 inches focal length, and cannot, therefore, carry a large, and consequently heavy, spectroscope of the ordinary type. Acting upon a suggestion from Prof. Hale, he has erected a spectroscope which is mounted upon, and is parallel to, the telescope tube, and finds that the device answers very satisfactorily. The beam from the 10-inch objective is reflected on to the slit of the spectroscope by a 90° prism, and, passing through the slit, is again reflected by a similar prism on to a 3-inch collimating lens of 39 inches focal length. Thence it passes to a grating and back through the 3-inch lens to the eye-piece, the grating and lens being slightly tilted. A negative lens placed between the 10-inch objective and the first reflecting prism gives a larger image, which in Mr. Mitchell's observations was of 3·2 inches diameter. The spectroscope tube is constructed of wood, saturated with hot paraffin before assembling to obviate subsequent warping.

With this instrument Mr. Mitchell gets a resolving power of 70,000 in the third-order spectrum, and was able to observe visually the Zeeman effect in sun-spot lines. An interesting observation on May 11 showed that at one end of a spot "bridge" certain lines were doubled, whilst at the other end, the farthest from the centre of the spot group, the same lines were triple; other lines were double in both regions. A list of lines, recorded as bright in a chromospheric outburst on January 21 7h. to 9h. G.M.T., is also given, and Mr. Mitchell urges the necessity for more laboratory work in connection with chromospheric radiations.

We regret to learn that astronomical observations are to be suspended at the Haverford Observatory, and, consequently, Mr. Mitchell's observations cannot be continued.

THE AURORA OF SEPTEMBER 25.—In No. 4361 of the *Astronomische Nachrichten* (p. 287, October 7) Herr Torvald Köhl records that a fine display of the aurora was observed at Odder, Denmark, on September 21, and adds that a similar display was observed in Stockholm on September 25.

SEPTEMBER METEORS.—The appearance of a magnificent fireball on September 27d. 7h. 20m. is recorded by Herr Köhl, who observed it at the Carina Observatory, Odder, in No. 4361 of the *Astronomische Nachrichten*. Herr Köhl finds from his meteor-catalogue that he observed similar apparitions on September 27–28 in ten different years between 1870 and 1909. He also has records of meteors on December 12–13 for eleven years between 1875 and 1908.

HYDROGEN LAYERS IN THE SOLAR ATMOSPHERE.—In the *Comptes rendus* for September 20 (No. 12, p. 521) MM. Deslandres and d'Azambuja review the work which has been done in separating the various layers of calcium vapour in the sun's atmosphere, and describe the results of similar researches on the hydrogen and iron vapours recently carried out at Meudon.

The image, obtained by using the centre of the Hα line, differs from the Mount Wilson photographs, and shows the details, exactly, of the K_3 calcium images, the same dark filaments and the same bright areas. The authors suggest that the Mount Wilson images were produced by mixtures of the different parts of the Hα line, and that the sinuosities in the edges of the various sections might produce this effect. In the dispersion used at Meudon 1 mm. = 6 Å.